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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,581	12/28/2005	Susumu Okazaki	36856.1389	7909

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EXAMINER	
ROSENAU, DEREK JOHN	
ART UNIT	PAPER NUMBER
2834	

NOTIFICATION DATE	DELIVERY MODE
11/07/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/562,581	OKAZAKI ET AL.	
	Examiner	Art Unit	
	Derek J. Rosenau	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 20030107300) in view of Mizusawa (US 6778029).

3. With respect to claim 7, Nakamura et al. discloses a piezoelectric electroacoustic transducer (Fig 1) comprising: a substantially square piezoelectric diaphragm (item 1) arranged to be vibrated in a thickness direction of the diaphragm by applying an alternating signal to lead electrodes thereof (Paragraph 14); a casing (item 10) including a supporting portion disposed on an inner circumference of the casing (Fig 1), the supporting portion supporting an outer circumference of said piezoelectric diaphragm (Fig 9); first and second terminals (items 11a and 12a) that are fixed to said casing so that inner connecting portions are exposed on said inner circumference of the casing (Fig 10); and conductive adhesives (items 14a and 14b) electrically connecting the lead electrodes of the piezoelectric diaphragm and the inner connecting portions of the first and second terminals (Fig 10); wherein one of said conductive adhesives is arranged between the inner connecting portion of said first terminal and one of the lead electrodes near one corner of said piezoelectric diaphragm (Fig 10); the other conductive adhesive is arranged between the inner connecting portion of said second

terminal and the other lead electrode near another corner of said piezoelectric diaphragm which is adjacent to the one corner of said piezoelectric diaphragm (Fig 10).

Nakamura et al. does not disclose expressly that the corner and the another corner of the piezoelectric diaphragm are disposed at opposite ends of one side of the piezoelectric diaphragm, or that the piezoelectric diaphragm and the conductive adhesive are arranged such that the displacement of vibrations of the piezoelectric diaphragm is circular.

Mizusawa teaches a piezoelectric transducer in which the corner and the another corner of the piezoelectric diaphragm are disposed at opposite ends of one side of the piezoelectric diaphragm (Figures 2, 38, and 5B).

The claim language “such that the displacement of vibrations of the piezoelectric diaphragm is circular" is functional language, and does not positively recite any structural elements; therefore, as the combination of Nakamura et al. and Mizusawa discloses each of the claimed structural elements, that combination would perform the same functions.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the terminal configuration of Mizusawa et al. with the piezoelectric electroacoustic transducer of Nakamura et al. for the benefit of simplifying the means of connection to the piezoelectric diaphragm by allowing all of the connections to be made at the same end of the device. In addition, it has been held that merely shifting the location of the parts of a device is obvious (*In re Kuhle*, 188 USPQ 7); therefore, at the

time of invention, it would have been obvious to a person of ordinary skill in the art to rearrange the lead electrodes such that they are at the same end of the device.

4. With respect to claim 8, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses that the location of one of said conductive adhesives faces the location of the other conductive adhesive across said piezoelectric diaphragm (Fig 10).

5. With respect to claim 9, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Mizusawa discloses that the location of one conductive adhesive and the location of another conductive adhesive are on one side of said piezoelectric diaphragm and near corners at both ends of the one side (Fig 2, 3B, or 5B).

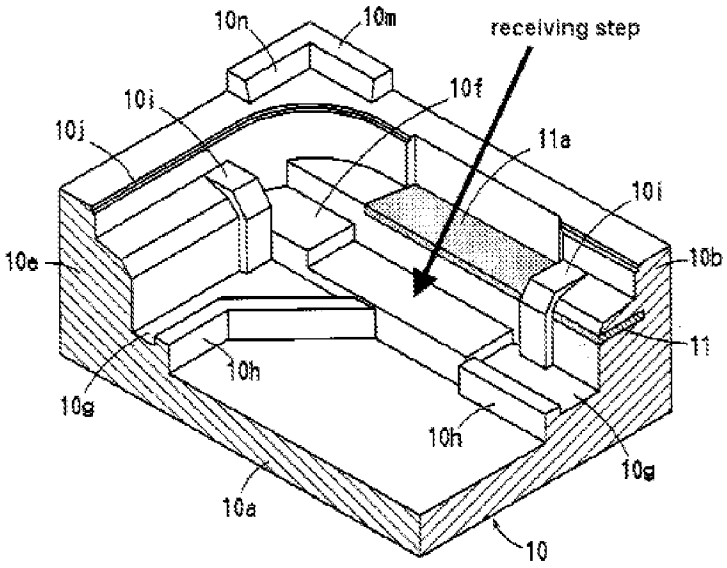
6. With respect to claim 10, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses that said piezoelectric diaphragm includes a quadrilateral piezoelectric member (item 1a) in contact with a quadrilateral metallic plate (item 2), wherein one of said lead electrodes is disposed on the surface of the piezoelectric member, and another of said lead electrodes is the metallic plate (Fig 3).

7. With respect to claim 11, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses that said piezoelectric diaphragm includes a plurality of piezoelectric ceramic layers (items 1a and 1b) sandwiching an inner electrode (item 4), said piezoelectric diaphragm including principle surface electrodes (items 2 and 3) on

principle surfaces of the front and back sides of said piezoelectric diaphragm (Fig 3), wherein one of said lead electrodes is connected to the inner electrode and the another of said lead electrodes is connected to the principle surface electrodes (Fig 3).

8. With respect to claim 12, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses that an elastic adhesive (items 13 a and 13c) is applied directly between the piezoelectric diaphragm and an inner connecting portion of one of said first and second terminals, and the conductive adhesive is disposed over the elastic adhesive so as to indirectly connect said inner connecting portion and said piezoelectric diaphragm (Fig 10).

9. With respect to claim 13, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses that the casing includes a receiving step (see figure below, figure 8 from Nakamura et al.) having a height lower than the supporting portion and a predetermined space between the receiving step and the bottom surface of the diaphragm (Fig 8).



10. With respect to claim 14, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses an elastic sealant in a space between an entire circumference of the diaphragm and an inner circumference of the casing (item 15).

11. With respect to claim 15, the combination of Nakamura et al. and Mizusawa discloses a piezoelectric electroacoustic transducer according to claim 7. Nakamura et al. discloses that the casing includes a groove (Fig 9, item 10g) and a wall (item 10h) arranged to prevent flow of the elastic sealant to a bottom wall of the casing (Fig 9).

12. With respect to claim 16, Nakamura et al. discloses a piezoelectric electroacoustic transducer (Fig 1) comprising: a quadrilateral piezoelectric diaphragm (item 1) arranged to be vibrated in a thickness direction of the diaphragm by applying an alternating signal to lead electrodes thereof (Paragraph 14); a casing (item 10) including a supporting portion disposed on an inner circumference of the casing (Fig 1), the supporting portion supporting an outer circumference of said piezoelectric diaphragm

(Fig 9); first and second terminals (items 11a and 12a) that are fixed to said casing so that inner connecting portions are exposed on said inner circumference of the casing (Fig 10); and conductive adhesives (items 14a and 14b) electrically connecting the lead electrodes of the piezoelectric diaphragm and the inner connecting portions of the first and second terminals (Fig 10); wherein one of said conductive adhesives is arranged between the inner connecting portion of said first terminal and one of the lead electrodes near one corner of said piezoelectric diaphragm (Fig 10); the other conductive adhesive is arranged between the inner connecting portion of said second terminal and the other lead electrode near another corner of said piezoelectric diaphragm which is adjacent to the one corner of said piezoelectric diaphragm (Fig 10); the casing includes four supports portions arranged at four inner corners of the casing (Fig 1 and Paragraph 47); and four corners of the diaphragm are supported by the four support portions of the casing (Fig 1 and Paragraph 47).

Nakamura et al. does not disclose expressly that the corner and the another corner of the piezoelectric diaphragm are disposed at opposite ends of one side of the piezoelectric diaphragm, or that the piezoelectric diaphragm and the conductive adhesive are arranged such that the displacement of vibrations of the piezoelectric diaphragm is circular.

Mizusawa teaches a piezoelectric transducer in which the corner and the another corner of the piezoelectric diaphragm are disposed at opposite ends of one side of the piezoelectric diaphragm (Figures 2, 38, and 5B).

The claim language “such that the displacement of vibrations of the piezoelectric diaphragm is circular" is functional language, and does not positively recite any structural elements; therefore, as the combination of Nakamura et al. and Mizusawa discloses each of the claimed structural elements, that combination would perform the same functions.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the terminal configuration of Mizusawa et al. with the piezoelectric electroacoustic transducer of Nakamura et al. for the benefit of simplifying the means of connection to the piezoelectric diaphragm by allowing all of the connections to be made at the same end of the device. In addition, it has been held that merely shifting the location of the parts of a device is obvious (*In re Kuhle*, 188 USPQ 7); therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to rearrange the lead electrodes such that they are at the same end of the device.

13. With respect to claim 25, the claimed subject matter therein corresponds to that of claims 7 and 16; therefore, claim 25 is unpatentable over Nakamura et al. in view of Mizusawa as in claims 7 and 16 above.

14. With respect to claims 17-24 and 26-33, the claimed subject matter therein corresponds to that of claims 8-15; therefore, claims 17-24 and 26-33 are unpatentable over Nakamura et al. in view of Mizusawa as in claims 8-15 above.

Response to Arguments

15. Applicant's arguments filed 12 August 2008 have been fully considered but they are not persuasive.

16. Applicant argues that the claimed arrangement of conductive adhesives would not have been obvious to a person of ordinary skill in the art due to the unexpected results of the node of vibration being shifted to the outside, the wavelength of the vibrations being lengthened, and the resonant frequency being lowered, which are a result of the circular displacement of vibration without distortion. However, as taught by Takeshima et al. (US 2003/0015942), arranging the conductive adhesives at the corners result in a circular displacement of vibration (Fig 1). Therefore, as the combination of Nakamura et al. and Mizusawa discloses this structure, its displacement of vibrations would be circular as well, and would therefore have its node of vibration shifted outward, wavelength lengthened, and resonant frequency lowered.

17. Applicant requests that the examiner explain how rearranging the connections of Nakamura et al. would simplify the means of connection. In response, the device of Nakamura shows electrical connections (items 11a and 12a) extending to all fours corners. By rearranging the connections, two of these electrical connections could be eliminated, as they would only be needed at one end of the device. In addition, it has been held that merely shifting the location of the parts of a device is obvious (*In re Kuhle*, 188 USPQ 7); therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to rearrange the lead electrodes such that they are at the same end of the device.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571) 272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leung Quyen can be reached on (571) 272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen P Leung/
Supervisory Patent Examiner, Art Unit 2834

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